

**WHAT IS CLAIMED IS:**

1. A food supplement, comprising  $\alpha$  lipoic acid or a derivative thereof, and at least one ingredient selected from the group consisting of amino acids and derivatives thereof and sources of amino acids, in amounts effective to increase lean muscle mass and strength.
2. A food supplement according to claim 1, wherein at least one amino acid is selected from the group consisting of glutamine, leucine, isoleucine, valine, arginine, alanine, and derivatives thereof.
3. A food supplement according to claim 2, wherein the amino acid is glutamine or a derivative thereof.
4. A food supplement according to claim 3, wherein the  $\alpha$  lipoic acid derivative is a salt or ester.
5. A food supplement according to claim 3, wherein the glutamine derivative is a salt, ester, or keto acid.
6. A food supplement according to claim 3, wherein the glutamine is a dipeptide, tripeptide, or oligopeptide.
7. A food supplement according to claim 3, wherein the glutamine is bound in a dipeptide or tripeptide bond with at least one other amino acid.
8. A food supplement according to claim 3, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is between about 0.1 mg to about 100 mg per g of food supplement and the amount of glutamine or glutamine derivative is between 1 mg to about 500 mg per g of food supplement.
9. A food supplement according to claim 3, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is between about 0.5 mg to about 50 mg per g of food supplement and the amount of glutamine or glutamine derivative is about 5 mg to about 300 mg per g of food supplement.
10. A food supplement according to claim 3, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is between about 1 mg to about 20 mg per g of supplement and the amount of glutamine or glutamine derivative is about 10 mg to about 200 mg per g of food supplement.
11. A food supplement according to claim 3, further comprising a carbohydrate.
12. A food supplement according to claim 3, further comprising creatine, ginseng, N-acetyl cysteine, phenylalanine, ascorbic acid, inositol, d-pinitol, alpha tocopherol, sodium, potassium or phosphorus.

13. A food supplement according to claim 1, wherein the source of amino acid is a protein.

14. A food supplement according to claim 13, wherein the protein is a whey protein.

15. A food supplement according to claim 14, wherein the whey protein is selected from the group consisting of WPI 97, Whey Peptides, WPC 80, and ION EXCHANGE whey protein.

16. A method for increasing lean muscle mass and strength in an animal, comprising administering to the animal a food supplement comprises  $\alpha$  lipoic acid or a derivative thereof, and at least one ingredient selected from the group consisting of amino acids and derivatives thereof and sources of amino acids, in amounts effective to increase lean muscle mass and strength.

17. A method according to 16, wherein at least one amino acid is selected from the group consisting of glutamine, leucine, isoleucine, valine, arginine, alanine and derivatives thereof.

18. A method according to claim 16, wherein the amino acid is glutamine or a derivative thereof.

19. A method according to claim 18, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is from about 10 mg to about 1000 mg per g of food supplement and the amount of glutamine or glutamine derivative is from about 0.01 g to about 100 g of glutamine per g of food supplement.

20. A method according to claim 18, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is from about 50 mg to about 500 mg per g of food supplement and the amount of glutamine or glutamine derivative is from about 0.05 g to about 50 g per g of food supplement.

21. A method according to claim 18, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is from about 100 mg to about 300 mg per g of food supplement and the amount of glutamine or glutamine derivative is from about 0.1 g to about 30 g per g of food supplement.

22. A method according to claim 18, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is from about 0.1 mg to about 40 mg per g of food supplement and the amount of glutamine or glutamine derivative is from about 1 g to about 500 g per g of food supplement.

23. A method according to claim 19, wherein the food supplement is about 1 g to about 500 g per day.

24. A method according to claim 19, wherein the food supplement is about 2 g to about 200 g per day.

5 25. A method according to claim 19, wherein the administering step is performed on a daily basis.

10 26. A method according to claim 16, wherein the administering step is performed immediately following an exercise period.

15 27. A method according to claim 16, wherein the food supplement further comprises a carbohydrate.

20 28. A method according to 16, wherein the source of amino acid is a protein.

29. A method according to 28, wherein the protein is a whey protein.

30 30. A method according to claim 29, wherein the protein is a whey protein.

31. A method according to claim 30, wherein the whey protein is selected from the group consisting of WPI 97, Whey Peptides, WPC 80, and ION EXCHANGE whey protein.

32. A method according to claim 16, wherein the food supplement is mixed with water to provide a liquid drink.

35 33. A method according to claim 16, wherein the food supplement is administered in a capsule or a pill.

30 34. A method according to claim 16, wherein the food supplement is administered in a nutrition bar.

40 35. A method for enhancing an athlete's muscle size, strength, glycogen storage or recuperative ability comprising administering to the diet of the athlete a food supplement comprising  $\alpha$  lipoic acid or a derivative thereof, and glutamine or a derivative thereof by maximizing post-exercise amino acid levels, insulin levels and insulin efficiency.

36. A method according to claim 35, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is from about 10 mg to about 1000 mg per g of food supplement and the amount of glutamine or glutamine derivatives is from about 0.01 g to about 100 g per g of food supplement.

37. A method according to claim 35, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is from about 50 mg to about 500 mg per g of food supplement and

the amount of glutamine or glutamine derivatives is from about 0.05 g to about 50 g per g of food supplement.

5        38. A method according to claim 35, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is from about 100 mg to about 300 mg per g of food supplement and the amount of glutamine or glutamine derivative is from about 0.1 g to about 30 g per g of food supplement.

10      39. A method according to claim 35, wherein the amount of  $\alpha$  lipoic acid or  $\alpha$  lipoic acid derivative is from about 0.1 mg to about 40 mg per g of food supplement and the amount of glutamine or glutamine derivatives is from about 1 g to about 500 g per g of food supplement.

15      40. A method according to claim 36 wherein the food supplement is administered to the diet of the athlete on a daily basis.

20      41. A method according to claim 36, the food supplement is administered in an amount of from about 1 g to about 500 g per day.

25      42. A method according to claim 36, the food supplement is administered in an amount of from about 2 g to about 200 g per day.

43. A method according to claim 35, wherein the food supplement further comprises a carbohydrate.